

## PATENT COOPERATION TREATY

**PCT**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

REC'D 29 AUG 2005

PCT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCTA9409-23	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/KR2004/002653</b>	International filing date (day/month/year) <b>15 OCTOBER 2004 (15.10.2004)</b>	Priority date (day/month/year) <b>15 OCTOBER 2003 (15.10.2003)</b>	
International Patent Classification (IPC) or national classification and IPC <b>IPC7 A61K 31/352, A61P 19/02</b>			
Applicant <b>KMSI CO.,LTD et al</b>			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			

Date of submission of the demand <b>19 APRIL 2005 (19.04.2005)</b>	Date of completion of this report <b>16 AUGUST 2005 (16.08.2005)</b>
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea	Authorized officer LEE, Mi Jeong Telephone No. 82-42-481-5601
Facsimile No. 82-42-472-7140	

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/002653

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language English, which is the language of a translation furnished for the purposes of:

- international search (under Rules 12.3 and 23.1(b))
- publication of the international application (under Rule 12.4)
- international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished

the description:

pages \_\_\_\_\_ received by this Authority on \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets \_\_\_\_\_  
 the sequence listing (*specify*) : \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*) : \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets \_\_\_\_\_  
 the sequence listing (*specify*) : \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*) : \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/002653

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	<u>1 - 8</u>	YES
	Claims	_____	NO

Inventive step (IS)	Claims	<u>1 - 8</u>	YES
	Claims	_____	NO

Industrial applicability (IA)	Claims	<u>1 - 7</u>	YES
	Claims	_____	NO

**2. Citations and explanations (Rule 70.7)**

The following documents are referred to in this report:

D1: WO 02/076241 A1 (03 Oct. 2002)

D2: US 6583118 B1 (24 Jun. 2003)

D3: KR 2000-0041190 A (15 Jul. 2000)

D4: US 4268517 A (19 May 1981)

**1. Novelty and Inventive Step**

Claims 1–8 of the present invention relate to a composition for treatment of osteoarthritis comprising apigenin (1–80 µM) as a chondroregenerative agent and a therapeutic method using the said composition.

D1 discloses the use of apigenin for the manufacture of a preparation for treatment and/or prevention of a disorder related to altered bone metabolism, in particular osteoporosis, osteopenia, Paget's disease, bone fracture, etc.

D2 discloses that a flavonoid compound of formula (1) including apigenin strongly inhibits proteoglycan depletion from the chondrocyte matrix and exhibits a function to protect cartilage, and thus, is extremely effective for treatment of arthropathy such as osteoarthritis.

D3 discloses a pharmaceutical composition comprising apigenin is effective for treatment of rheumatoid arthritis, osteoporosis, and bone fracture.

D4 discloses that (+)-catechin of which the structure is similar to apigenin accelerates the formation of collagen fiber, and inhibits the degradation of collagen fibers and synthesis of prostaglandin E2. As a result, (+)-catechin decreases the development of osteoporosis at the level of affected articulations and prevents degradation of the connective tissue.

As mentioned before, D1–D4 disclose or suggest that apigenin can be used as a chondroprotective agent, but none of D1–D4 discloses that apigenin can be used as a chondroregenerative agent.

Since there is no suggestion or implication in D1–D4 to lead those who skilled in the art to expect that apigenin could regenerate cartilage tissues as well as protect them, claims 1–8 of the present invention are considered to be novel and involve an inventive step over D1–D4 [Article 33(2) and 33(3) PCT].

(Continued on the Supplemental Sheet.)

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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**Supplemental Box****In case the space in any of the preceding boxes is not sufficient.****Continuation of:**

Box V.

**2. Industrial Applicability**

The subject-matter of claims 1–7 appears to be industrially applicable.

Claim 8 relates to a method of therapeutic treatment. Concerning the assessment of the industrial applicability of the subject-matter relating to therapeutic applications, no unified criteria exist in the PCT. The patentability can also be dependent upon the formulation of the claims [Article 33(4) PCT].